

***Guide***  
***To Taking The Written Test For***

**FIREFIGHTER SERIES**



**New York State Department of Civil Service**  
**Albany, New York**  
**1999**

## *INTRODUCTION*

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The New York State Department of Civil Service has developed this Guide to familiarize you with the Firefighter Series written test. It provides a general description of the subject areas to be tested and the different types of questions you will see on the test. The Examination Announcement will specify the exact subject areas to be included on the test you will be taking.

The Firefighter Series written test has an overall time allowance of 3 ½ hours. The test is divided into four separate subject areas and the questions are designed to evaluate the following abilities:

- 1. UNDERSTANDING AND INTERPRETING GRAPHS, CHARTS, TABLES AND DIAGRAMS AND FOLLOWING WRITTEN INSTRUCTIONS:** These questions test your ability to understand information that is presented graphically or tabularly and to follow written directions.
- 2. SOLVING PROBLEMS INVOLVING NUMBERS:** These questions test your ability to use addition, subtraction, multiplication and division to solve problems that might be encountered in fire service activities.
- 3. MECHANICAL REASONING:** These questions test your ability to make accurate readings of dials and gauges or to demonstrate an understanding of how devices work.
- 4. UNDERSTANDING AND INTERPRETING WRITTEN MATERIAL PERTAINING TO FIRE:** These questions test how well you comprehend written material.

These are the only subject areas that will be included on the written test. Specialized knowledge of firefighting is not required.

The remainder of this guide explains how you are tested in each of these subject areas. A **TEST TASK** is provided for each subject. This is an explanation of how a question is presented and how to correctly answer it. Be sure to read each one carefully.

You will also be given at least one **SAMPLE QUESTION** for each subject area. It will be of the type that you will see on the actual test. The **SOLUTION** and correct answer are provided after each question. You should study the question and its solution until you understand how it works.

## SUBJECT AREA 1

**UNDERSTANDING AND INTERPRETING GRAPHS, CHARTS, TABLES AND DIAGRAMMS AND FOLLOWING WRITTEN INSTRUCTIONS:** These questions test your ability to understand information that is presented graphically or tabularly and to follow written directions.

**TEST TASK:** You are given questions that contain such things as graphs, charts, tables, diagrams or operating instructions for devices. You must locate information on these charts, tables or diagrams or follow instructions for operating devices in order to answer the questions.

All information required to answer a question is provided. Specialized knowledge of the subject matter is not required to successfully answer the questions.

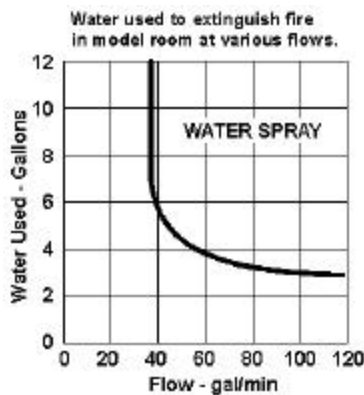
### **SAMPLE QUESTIONS:**

1. According to the information in the chart below, which one of the following is the pump pressure required to produce a nozzle pressure of 80 when using 3½" hose?
- A. 89 psi                      C. 128 psi  
B. 105 psi                     D. 355 psi

FRICTION LOSS COMPARISON 500 gpm Flowing Through 500' Hose			
Hose Diameter	Nozzle Pressure psi	Friction Loss psi	Pump Pressure psi
2 ½"	80	275	355
3"	80	106	186
3 ½"	80	48	128
4"	80	25	105
5"	80	9	89

**SOLUTION:** The question asks what PUMP PRESSURE is required. Therefore, you know that the answer is contained in the column labelled Pump Pressure. You know that you are using a 3½" hose. Therefore, eliminate all but the 3½" hose row. Follow this row across to where it intersects with the Pump Pressure column. The answer is 128 (C).

2. According to the chart below, which one of the following statements best describes the relationship between the rate of flow in gallons per minute and the amount of water required to extinguish a fire when the rate of flow is between 40 and 80 gal/min?
- A. The greater the flow, the less water required for extinguishment.                      C. The greater the flow, the more water required for extinguishment.  
B. The greater the flow, the less water required, up to a point; then greater flows required more water for extinguishment                      D. There is no discernible relationship between the flow and the amount of water required for extinguishment.



**SOLUTION:** Looking at the diagram, you can observe that at a flow of 40 gallons per minute it would take nearly 6 gallons of water to extinguish the fire. If you increase the flow to 80 gallons per minute, it would take less than 4 gallons of water. Therefore, you know that a greater flow means less water used. Now, evaluate the choices. The answer is (A).

## SUBJECT AREA 2

**SOLVING PROBLEMS INVOLVING NUMBERS:** These questions test your ability to use addition, subtraction, multiplication and division to solve problems that might be encountered in fire service activities.

**TEST TASK:** You are required to use addition, subtraction, multiplication, and division to solve problems that might be encountered in fire service activities. In some of the questions, sketches of simple geometric figures may be shown or simple geometric terms used. The problems are presented in the context of the job. Knowledge of firefighting is not required. Formulas will be provided where required.

### **SAMPLE QUESTIONS:**

3. A pump discharges water at a rate of 184 gallons per minute. Which one of the following is the number of gallons of water this pump will discharge in an hour?
- A. 1,104 gallons
  - B. 1,840 gallons
  - C. 2,208 gallons
  - D. 11,040 gallons

**SOLUTION:** To solve this question you must know that there are 60 minutes in an hour. So you multiply 184 gallons (the amount discharged in one minute) by 60 (the number of minutes in an hour). The answer is 11,040 gallons (D).

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4. "Back pressure" is the pressure, measured in pounds/sq. in. (psi), which a column of water exerts against the engine or hydrant which is forcing the water through a pipe system or a hose stretched to a height. "Back pressure" can be found by multiplying 0.434 by the height of the pipe system, in feet. If the height of the pipe system is 180 feet, which one of the following is most nearly the "back pressure"?
- A. 7.8 psi
  - B. 78.1 psi
  - C. 708.2 psi
  - D. 7812.0 psi

**SOLUTION:** This question asks about back pressure and tells you that back pressure can be found by multiplying 0.434 by the height of the pipe system, which you are told is 180 feet. Therefore,  $0.434 \times 180 = 78.1$ ; and the answer is B. To answer this question, you also have to know where to place the decimal point.

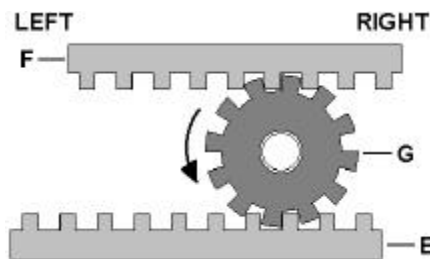
## SUBJECT AREA 3

**MECHANICAL REASONING:** These questions test your ability to make accurate readings of dials and gauges or to demonstrate an understanding of how devices work.

**TEST TASK:** The questions in this subject area will be accompanied by sketches or descriptions of various mechanical devices, hand tools, dials or gauges. You may be required to demonstrate an understanding of how the devices work, or know the use for various tools or devices; or to make accurate readings of dials and gauges. The various devices, tools, gauges, etc., pictured or described in the subject area are commonly used and not limited to use in the fire service.

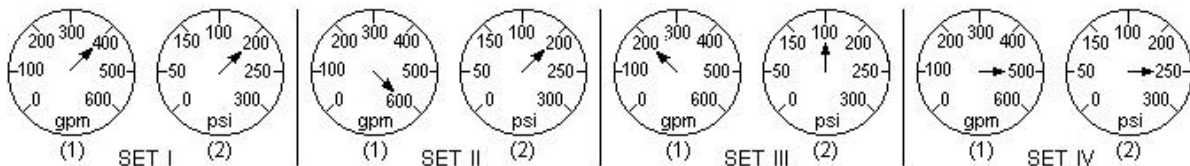
### **SAMPLE QUESTIONS:**

5. In the figure below, how will the two racks, E and F, move when gear G is rotated on its fixed axis in the direction indicated by the arrow?
- A. both racks will move to the left
  - B. rack F will move to the left while rack E will move to the right
  - C. rack F will move to the right while rack E will move to the left
  - D. both racks will move to the right



**SOLUTION:** To answer this question, look at each part separately. What will happen to F when G moves? The teeth in G will lock with the teeth in F and cause F to move to the left. What will happen to E when G moves? The teeth in G will lock with the teeth in E and cause E to move to the right. Therefore, the correct answer is B.

6. The diagram below shows four sets of dials. Dial (1) in each set displays gallons per minute (gpm) Flow Rate. Dial (2) in each set displays pressure per square inch (psi). If a pump works most efficiently at a flow rate of less than 500 gpm and a pressure of 200 psi, which one of the sets of dials indicates a pump that is working most efficiently?
- A. Set 1
  - B. Set 2
  - C. Set 3
  - D. Set 4



**SOLUTION:** The question tells you that a pump works most efficiently at a flow rate of less than 500 gpm and a pressure of 200 PSI. It also tells you that dial (1) in each set is the gpm. Only two sets, I and III, have flow rates of less than 500 gpm. Set I is the only set that has a flow rate less than 500 gpm and a pressure of 200 psi. Therefore, the correct answer is A.

## SUBJECT AREA 4

**UNDERSTANDING AND INTERPRETING WRITTEN MATERIAL PERTAINING TO FIRE:** These questions test how well you comprehend written material.

**TEST TASK:** You will be provided with brief reading selections, followed by a set of alternative statements relating to each selection. You must indicate the most appropriate statement relating to the selection on the basis of whether it: 1) accurately paraphrases portions of the selection; or 2) adequately summarizes the selection; or 3) presents an inference that can reasonably be drawn from the selection.

The reading selections are drawn from a variety of sources related to the firefighting field. Knowledge of the subject matter of the reading selection is generally not related to successfully answering the questions.

### **SAMPLE QUESTION:**

7. "Oxydizing materials shall include a substance that yields oxygen readily to stimulate the combustion of organic matter. Oxidizing materials shall be stored in cool, dry, ventilated locations and separated from stored organic materials. Oxidizing materials shall be stored separately from flammable liquids, flammable solids, combustible materials, hazardous chemicals, corrosive liquids and such other noncompatible materials. Bulk oxidizing materials shall not be stored on or against wooden surfaces."

Which one of the following statements is correct according to the above passage?

- A. Oxidizing materials should be stored away from organic materials.
- B. Organic matter should be stored on wooden piles.
- C. Oxidizing materials should be stored with flammable solids.
- D. Corrosive liquids should be stored with hazardous chemicals.

**SOLUTION:** To answer this question, evaluate all the choices. Choice A states that Oxidizing material should be stored away from organic materials. The paragraph says that oxidizing materials shall be separated from stored organic materials. This choice is correct.

Choice B states that organic material should be stored on wooden piles. The paragraph states that bulk oxidizing materials shall not be stored on... wooden surfaces. The paragraph does not discuss where organic material should be stored. Therefore, this choice is incorrect.

Choice C states that oxidizing materials should be stored with flammable solids. The paragraph states that oxidizing material shall be stored separately from flammable solids. So, this choice is incorrect.

Choice D states that corrosive liquids should be stored with hazardous chemicals. The paragraph states that oxidizing materials shall be stored separately from corrosive liquids but it does not state where corrosive liquids should be stored. Therefore, this choice is incorrect.

## CONCLUSION

You and your feelings about tests have a great deal to do with how you perform on a test. Some people get so tense and nervous that they don't do as well as they could. They forget things they know or make simple mistakes. The following suggestions should help you overcome these problems.

- Study and review this Guide to become familiar with the test contents.
- Give yourself plenty of time to do what you need to do before the test starts. Arrive at the test room a little ahead of the starting time.
- Try to relax just before the test starts.
- Listen carefully to the instructions the Monitors give you. Carefully read all instructions on the Candidate Directions you are given at the test as well as information on the covers of the test booklets.
- Try to keep calm, cool and collected throughout the test.
- Keep track of time.